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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 0504

Application Number: 10/059,577
Filing Date: January 29, 2002
Appellant(s): LEONARD ET AL.

Joseph E. Waters
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 4/26/04.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct; except that there was no advisory action in this case, appeal is over the final rejection mailed September 25, 2003.

(4) Status of Amendments After Final

The Appellants' statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The Appellants' statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellants' brief includes a statement that claims 1-15,26,27,30 and 31 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5275736	O'DOWD	1-9994
4483771	KOCH	11-1984

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1-5,7,9,10,13,26,27,30 and 31 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by O'Dowd (US 5,275,736).

O'Dowd teaches a method of producing aqueous solution of thermodynamically free iodine from iodine vapor transferred across a membrane from an iodine source having a membrane permeable to iodine vapor enclosing the source of iodine vapor, and providing a vessel which contains the receiving medium for iodine permeated across the membrane (see figures, col 3 lines 28-47, col 4 line 43- col 5 line 21) as in claims 1. The iodine source is a liquid or solid as in claim 2 (col 2 lines 3-14). The iodine vapor is absorbed by the liquid contained in the vessel as in claim 3, where in the receiving medium is static (col 4 line 66-col 5 line 21). The method comprises passing iodine vapor from the source to a gas as in claim 4 and then to the liquid medium(col 6 line 67 – col 7 line 11). The membrane is a plastic as in claim 5, single ply as in claim 7, continuous film as in claim 9, non-woven as in claim 10, non-permeable to solid iodine as in claim 13 (col 6 lines 33-47).

Independent Claims 26 and 27 add the further limitations to claim 1 of controlling flow of iodine receiving medium in a batch or continuous process (taught by O'Dowd in

col 5 line 41 – col 6 line 7: batch process), and preparing the iodine fluid for dietary purposes, which O'Dowd teaches in col 1 lines 40-50).

Independent Claim 30 is broader than claim 1 having halogen in place of iodine, and claim 31 depends from claim 30. O'Dowd teaches all the limitations of claims 30 and 31 as in claims 1 and 3 above. Iodine is a halogen.

Re the newly added limitation "porous membrane" in claims 1,26,27 and 30, O'Dowd teaches a barrier that permeates vapor (PBT, polyoxymethylene: see abstract and col 6 lines 33-38) and claims such a barrier, which would include the porous membrane as claimed by the applicant.

2. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Dowd (736).

O'Dowd teaches all the limitations of claim 1. Claim 15 adds further limitations of vessel being substantially impermeable to iodine vapor (col 4 lines 43-46); maintaining temperature between –10 and 110 deg F, Vacuum to 5 atm pressure, and constructing and testing the vessel for the pressure rating. O'Dowd teaches vacuum (col 7 lines 3-6), but is silent on the temperature and the vessel testing. However, it would be obvious to one of ordinary skill in the art that the temperature of O'Dowd's process is the ambient temperature, which falls in the range of –10 to 110 F, and that one would construct and test the vessels for its operating conditions for safety per code requirements.

3. Claims 6, 8, 11,12 and14 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Dowd (736) in view of Koch (US 4,483,771).

O'Dowd teaches all the limitations of claim 1. Instant claims add further limitations, which O'Dowd does not teach, but Koch teaches, as follows: the iodine permeable membrane is inorganic (claim 6) (col 3 lines 10-15), is multi-ply with same or different structure (claim 8) (col 3 lines 39-45), has nano-structure (claim 11) (col 2 lines 43-46), perforated (claim 12) (col 2 lines 35-55), and transferring iodine vapors through pores less than 5 microns (claim 14) (col 2 lines 39-45). It would be obvious to one of ordinary skill in the art to use the teachings of Koch in the teachings of O'Dowd for such applications as described by Koch col 3 lines 43-56 and for strength and safety (Koch – col 1 lines 59-66).

4. Claims 1-3, 5-14,26,27,30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koch (US 4,483,771) in view of O'Dowd (736).

Koch teaches a method of producing aqueous solution of iodine from iodine transferred across a porous membrane that is permeable to vapors but impermeable to water or solids (Fig 2, col 3 lines 7-55) as in claims 1,26,27 and 30. Iodine source is provided inside the envelope (fig 2) of a microporous membrane (col 3 lines 29-40).

Koch does not specifically teach having the 'filter' in a vessel that contains the receiving medium in instant claims, or a batch or continuous process as in claims 26 and 27. O'Dowd teaches an iodine pouch in a vessel that contains the receiving medium, and a batch process (see figures, col 3 lines 28-47, col 4 line 43- col 5 line 21,

col 5 line 41 – col 6 line 7). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of O'Dowd in the teaching of Koch to have a vessel containing the receiving medium and the iodine filter for releasing thermodynamically free iodine into the receiving medium. Claim 30 recites a halogen instead of iodine, but iodine is a halogen. Claims 26 and 27 teach dietary or disinfectant, which Koch teaches (col 3 lines 43-60).

Koch teaches the further added limitations of claims 2,3, and 5-14 as follows: Iodine releasing solid or liquid as in claim 2, mixing iodine vapor with flowing inert gas, with receiving medium static or moving as in claim 3, membrane is a plastic as in claim 5, inorganic membrane as in claim 6, membrane is single ply as in claim 7, multiply as in claim 8, continuous film as in claim 9, non-woven as in claim 10, nano-structure as in claim 11, perforated as in claim 12, non-permeable to solid iodine as in claim 13, pore size less than 5 microns as in claim 14 (see figure 2 and col 3 lines 7-60).

(11) Response to Argument

Claims were rejected in the first office action based on the same set of references as stated above. In response to the first action, Appellants amended independent claims 1, 26,27 and 30 by adding the adjective "porous" to 'membrane' in an attempt to overcome the O'Dowd reference. O'Dowd teaches a membrane that is impermeable to liquids and solids and permeable to iodine vapor. Re water-vapor, O'Dowd teaches at least some materials that are inherently permeable to water vapor like polybutylene terephthalate (col 6 lines 33-38) and does not teach that the

membrane is impermeable to water vapor (data sheets on PBT and LDPE showing vapor permeability values from "Plastics Design Library" are provided in support). The Examiner would concede that O'Dowd teaches a non-porous barrier in col 3 lines 30-33, wherein the driving force for transport of iodine is its vapor-pressure difference. However, the porous membrane, as defined by the applicant, encompasses the non-porous barrier taught by the reference, as shown in the paragraphs below.

In the specification, Appellants disclose "porous" materials in a rather wide range (***vapor-permeable, organic or inorganic, solid or liquid membranes***: page 7 lines 17-20), with ***the pore size less than 5 microns*** (with no lower limit) and ***porosity that can be chosen at will*** (page 10 lines 7-15). Examples of these iodine vapor-permeable membranes are permeable fabrics, reverse osmosis membranes, fuel cell membranes, diafiltration and ultrafiltration membranes, molecular sieves, nano-porous filters and media, and micro-crystalline filters (page 10 lines 7-15). Thus the Appellants have covered every possible membrane and membrane material with the only specific limitation being that the pore size is less than 5 microns. One of ordinary skill in the art would readily recognize that the O'Dowd teaching of "non-porous material" falls within these bounds.

A. In Appellants' arguments re the 102(b) rejection over the O'Dowd ref (starts at page 4 of the appeal brief), Appellants argue that O'Dowd teaches a non-porous membrane, and Examiner is attempting to equate "porous" with "permeable" (page 5 – para 2). In response, the issue the Examiner is addressing is not whether 'permeable' could be equated to 'porous', but what constitutes 'porous' by the Appellants' definition.

Since the claims are not limited by any specific metes and bounds for the definition of 'porous', Examiner has given it the broadest interpretation in the light of the specification, and found that the non-porous membrane taught by the O'Dowd reference falls within the Appellants' definition of 'porous', because O'Dowd's membrane is permeable to iodine vapor and water-vapor, it's pore size is less than 5 microns, and porosity (chosen at will) is zero or close to zero. Moreover, the O'Dowd reference also discourages use of porous materials that transmit liquid water. All these make the O'Dowd reference anticipate claims 1- 5, 7, 9, 10, 13, 26, 27, 30 and 31.

In response to Appellants' argument of "iodine does not pass through pores in the membrane, as required by the present invention" (page 5 para 2), this limitation is not recited in the claims.

In response to Appellants' argument (page g bottom/page 6 top paragraph of the brief), "... it [O'Dowd] fails to disclose a membrane that is permeable to both iodine and water-vapor ...", and "The Examiner cannot point out to one instance in O'Dowd ... that the solid barrier discloses therein is permeable to water-vapor": First of all, O'Dowd does not say anywhere that the membrane is impermeable to water-vapor. In col 4 lines 17-36, O'Dowd teaches a membrane impermeable to water, not water vapor. Secondly, at least some of the materials taught by O'Dowd are inherently water vapor permeable (see relevant pages from "Plastics Design Library"; printed from the internet: http://www.knovel.com/knovel2/Toc.jsp?BookID=752 , attached) . Under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be

anticipated by the prior art device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986).

In response to Appellants' argument about the mechanism of transport of iodine across the O'Dowd membrane (page 4 of the brief, bottom paragraph) wherein Appellants argue that the iodine is not transported across the O'Dowd membrane in the vapor phase through pores in the membrane, but by dissolution. This argument is not commensurate with the claims, because the claims do not have a limitation to the mechanism of transport across the membrane as 'passing through pores of the membrane in vapor phase'. (This is particularly so in claim 9, which claims a "continuous film"). On the other hand, O'Dowd teaches transport of iodine across the membrane, and what comes out on the other side is iodine vapor: see O'Dowd abstract. [It may be noted that iodine, being a material that sublimes, will have iodine vapor in equilibrium with the solids. More over, sorption and permeation of materials across barrier films is in the molecular phase, or vapor phase. Therefore, the transport of iodine, as described by the applicant in the argument is a vapor-phase transport]

In response to the argument (on page 6 of the brief, top paragraph): "In fact, having a solid barrier that was permeable to water vapor would hinder the process described in O'Dowd since the process is driven by the vapor pressure differential of iodine vapor between the two sides of the barrier. Allowing water vapor to diffuse through the solid barrier would allow the vapor pressure to equilibrate with a reduced

transfer of iodine from one side to the other" (emphasis added). This is a conjunctive opinion on the Appellants' part with no scientific backing. In fact, partial pressures of water and iodine on the upstream side of the membrane will be equal to the vapor pressures of iodine and water in an iodine-water-vapor equilibrium (saturation; see any standard Physical Chemistry text book). Driving force through the membrane for iodine will dependent on the partial pressure difference of iodine between the downstream side and the upstream side. Since the upstream side is always saturated (by design, and equal to vapor pressure), partial pressure at the downstream side controls the driving force. Permeation of iodine stops only when the downstream side also reaches saturation in iodine. Transmission of water-vapor through the membrane will have no negative effect on the transmission of iodine. On the other hand, a high rate of water-vapor transmission through the membrane would help the transmission of iodine through the membrane because water-vapor would carry the iodine vapor away from the downstream side, thereby reducing the downstream side partial pressure of iodine. This is true whether the membrane is just a permeable film or a porous membrane, because, irrespective of the transmission rate through the membrane, transmission is driven by the partial pressure difference across the membrane. Even if the Appellants' argument is considered correct, it would go against the Appellants' invention, because a higher water-vapor transmission rate expected of the Appellants' membrane would only reduce the iodine transmission rate through that membrane if this argument is true.

B. In response to Appellants' arguments re the rejection of claim 15 – the arguments are based on the limitations of claim 1, and are addressed above.

C. Appellants' combined argument on the 103 (a) rejections of claims 6, 8, 11,12 and14 over O'Dowd (736) in view of Koch (US 4,483,771) and Claims 1-3, 5-14, 26, 27, 30 and 31 over Koch (US 4,483,771) in view of O'Dowd (736):

Contrary to Appellants' arguments that they be treated together, the two groups of rejections are separate, have different basis and should be treated separately. Appellants regard the combination of references as impermissible because (1) there is no motivation to combine the arts, (2) the references relate to completely different subject matter, (3) Both references teach away from there [sic, their] combination (page 7, 4th and 5th paragraph of the brief).

In response:

The argument that the references relate to completely different subject matter is not proper. O'Dowd teaches a method of producing thermodynamically free iodine solution in water, and keeps thermodynamically releasable iodine contained in a permeable barrier membrane (figures 1-3). Koch teaches an envelope made of microporous membrane in which an antibacterial material, such as iodine, is contained for release into fluids to be treated. Both references have iodine for the purpose of disinfecting, both release iodine into fluids, and both have iodine stored enclosed in a membrane. Therefore the two references teach similar subject matter, and are analogous. They are also pertinent to the particular problem with which the applicant

was concerned (like the different types of membranes used), in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).

Re the argument that there is no motivation to combine: the motivation is clearly stated in the respective rejections. It is important to consider the two rejections separately at least for the motivation to combine. In the rejection of claims 6,8,11,12 and 14 (these claims have limitations on the membrane material or structure) over O'Dowd in view of Koch, the Koch reference teaches the different membranes and gives excellent motivation for combining with O'Dowd in col 1 lines 59-66, such as selection of the membrane material or structure based on application, strength and safety. In the rejection of claims 1-3,5-14,26,27,30 and 31 based on Koch in view of O'Dowd, the deficiency of the Koch reference is that it does not teach a vessel that contains the receiving medium and the 'thermodynamically free' iodine, which are taught by O'Dowd, and the motivation to combine is given by O'Dowd, which is "for releasing the more effective thermodynamically free iodine into a receiving medium for applications as taught by O'Dowd" (abstract, col 1 lines 35-60).

Re the argument that the references teach away from the combination: O'Dowd teaches membrane impermeable to water (col 4 lines 17-20), not water-vapor. O'Dowd is silent on water-vapor permeability, but at least some of the materials used are permeable to water vapor, as shown in the above paragraphs. O'Dowd discourages using liquid-water permeable materials to contain the iodine because "...such materials cannot provide stable levels of iodine below saturation level for iodine in a fluid in

contact with the iodine", and/or "...may cause contamination of iodine" (see col 2 lines 25-42; also please note the referred US Patent 4,384,960 to Polley, which teaches iodine containing porous pouches). Koch teaches hydrophobic membranes, which are also non-permeable to liquid water (water repellent: see col 3 lines 15-20). Therefore the two references do not teach away. Argument that in Koch ref, the iodine is held within the membrane envelop, while water is allowed and other fluids are allowed to pass freely is also not proper, because there is nothing in the reference that prevents the iodine vapor from migrating through the membrane.

The rest of the arguments in pages 8 and 9 of the brief are regarding the dependent species claims. First of all, the species claims should be considered equivalent because the Appellants' disclosure, which states in effect that any membrane [from a wide range of materials and membranes – specification page 7 lines 17-20; page 10 lines 7-15] can be chosen as long as "***the pore size less than 5 microns*** [with no lower limit] .... and ....***porosity that can be chosen at will*** (specification page 10 lines 7-15). Even if the species are not considered equivalent but patentably distinct, the elements of the species claims are taught by the references as follows: Re the individual materials (species), Koch or O'Dowd teach all of them. Single or multi-ply in claims 7,8 – Koch (col 3 lines 6-28) teaches one or two plies; inorganic material – claim 6: see non-plastic material, and carbon in Koch ref (the claim is open ended); non-woven – the material in the macro layer is non-woven from description and by depictions in the figures of Koch; nano-structure – claim 11: Koch col 2 lines 58-60 – pore size 0.1 micron, or 100 nm – is a nano-structure; perforated structure as in claim

12 – this in conjunction with the specification disclosing less than 5 microns – Koch in col 2 lines 35-55 teaches the macrostructure as having 1 to 100 microns pore size.

In conclusion, the Examiner, after giving the broadest reasonable interpretation of the claims in conjunction with the specification, believes that the non-porous membrane of O'Dowd anticipates the "porous membrane" as specified by the applicant because of the wide range of membrane materials and structures included by the applicant in the range for the "porous membrane" starting from dense film (continuous film in claim 9; pores size less than 5 microns and porosity at will) to non-woven fabric, and including materials that are liquid or solid, organic or inorganic. Both Koch and O'Dowd references are analogous art, and complement each-other for the missing elements in each reference.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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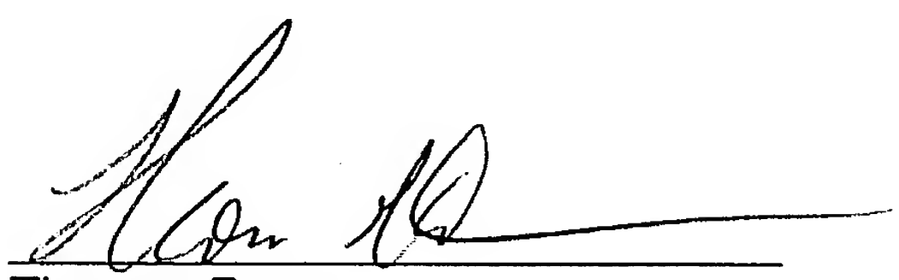
May 12, 2004

Conferees



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